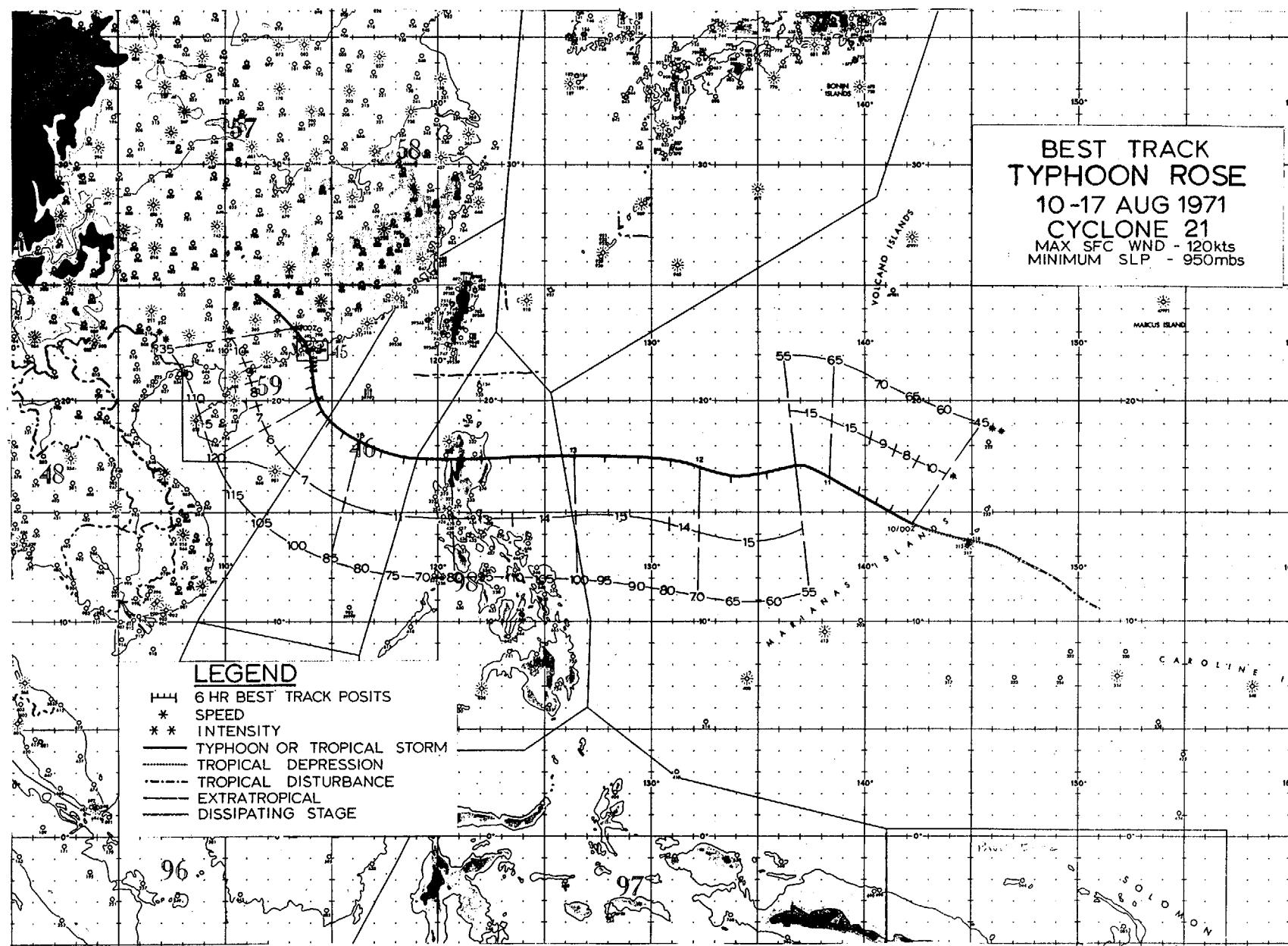


5-82



ROSE

During her early life, Rose was in a class of midget typhoons having an area extent of 100-150 miles (Figure 5-30). Before her life cycle was spent, however, Rose had the distinction of being the most disasterous typhoon of the 1971 season.

A small circulation was evident in synoptic and satellite data as early as the 7th at a position north of Truk. On the evening of August 9th, the radars at Fleet Weather Central Guam and Andersen AFB, Guam detected a small circulation with spiraling convection passing just north of Guam. Aircraft investigation the following morning revealed a mini-storm with 35- to 40-kt winds. By the late afternoon, Rose coiled to minimum typhoon strength with no increase in size and set out on a westerly course at 14-15 kt for Luzon. Except for a 12-hour period during the late afternoon and evening of the 11th, Rose remained at typhoon strength as she navigated the Philippine Sea and gradually generated winds to 110 kt before striking Luzon.

It is noteworthy that, although Rose exhibited typhoon-force winds, the central pressures observed by reconnaissance aircraft were unusually high for the standard pressure-wind relationships used at JTWC (Takahasi, 1939). It is believed the small size and tight gradients associated with Rose were responsible for this anomaly.

Making landfall north of Palanan Point, Rose crossed the mountainous terrain of northern Luzon and emerged in the South China Sea as a minimal typhoon. While inland, the Philippine Weather Bureau station at Tuguegarao reported maximum winds of 75 kt and the barometer dipped to 986.5 mb during center passage.

Rose had been steered for several days by a strong high cell centered near Shanghai. This cell began to weaken significantly as Rose began her journey in the South China Sea. In response to the synoptic-scale changes, the typhoon shifted to a more northwesterly course and began to slow to 6-7 kt in forward movement later on the 15th. Aircraft reconnaissance reports indicated deepening was taking place before Rose crossed the no-fly zone as the central pressure dropped from 980 mb to 959 mb in ten hours during the 15th.

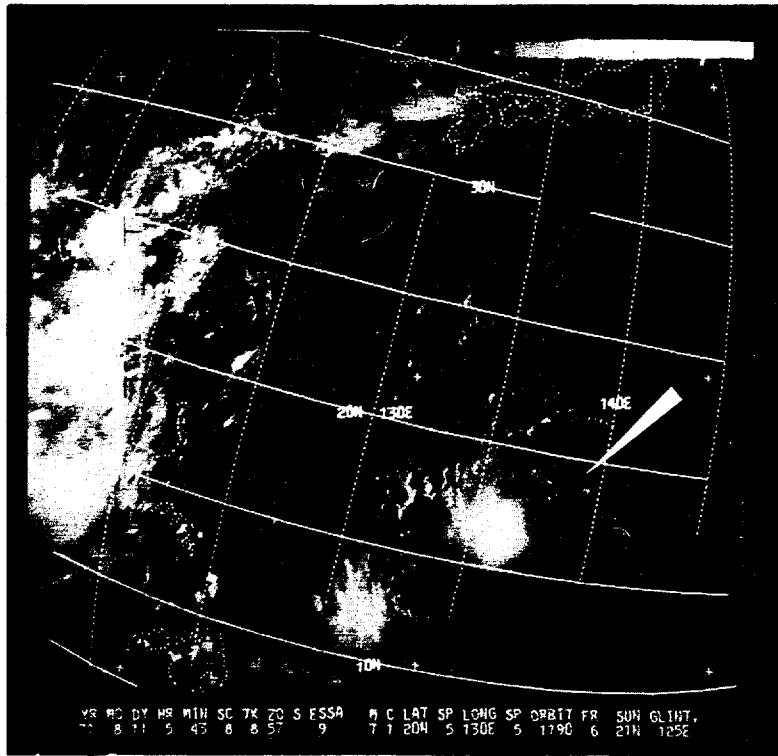


FIGURE 5-30. MINI-TYPOON ROSE AS PHOTOGRAPHED BY ESSA-9 ON 11 AUGUST.



FIGURE 5-31. RADARSCOPE PICTURE OF ROSE TAKEN AT 0400 GMT 16 AUGUST 1971 FROM THE ROYAL OBSERVATORY'S RADAR (RANGE MARKS 40 N MI)--COURTESY ROYAL OBSERVATORY HONG KONG.

The eye of the storm began to appear on the radar at the Royal Observatory the afternoon of the 16th (Figures 2-15 and 5-31), while a ship report in the vicinity of the eye confirmed that the deepening trend had continued to 950 mb. The SS NUDDEA reported winds of 90-110 kt close to the center. Considering last reports from aircraft penetration of Rose and the continued deepening trend, the typhoon probably peaked near 120 kt at this time before weakening slightly when the eye arrived at Lantau Island off Hong Kong shortly after midnight of the 16th. Moving inland on the 17th, the storm weakened and dissipated northeast of Canton the following day.

Meteorological extremes measured within the colony showed a minimum pressure of 963.2 mb at Cheang Chau after midnight while a maximum gust of 121 kt was reported at the Royal Observatory. The 11.34 inches of rain which fell at the Observatory during the 24 hours of Rose's passage was the highest value ever recorded in one calendar day in August.

Typhoon Rose was probably one of the most intense and violent typhoons that has affected Hong Kong. Twenty-six ocean-going vessels went aground and two were sunk (Table 5-1). A total of 130 deaths was attributable to the typhoon and over 5,600 people were made homeless. Also in the harbor, some 300 small craft including 100 pleasure craft were sunk or damaged (Figure 5-32).

The Macao ferry FATSHAN capsized resulting in the loss of 88 crew members and is regarded as one of the worst maritime disasters in the colony's history.

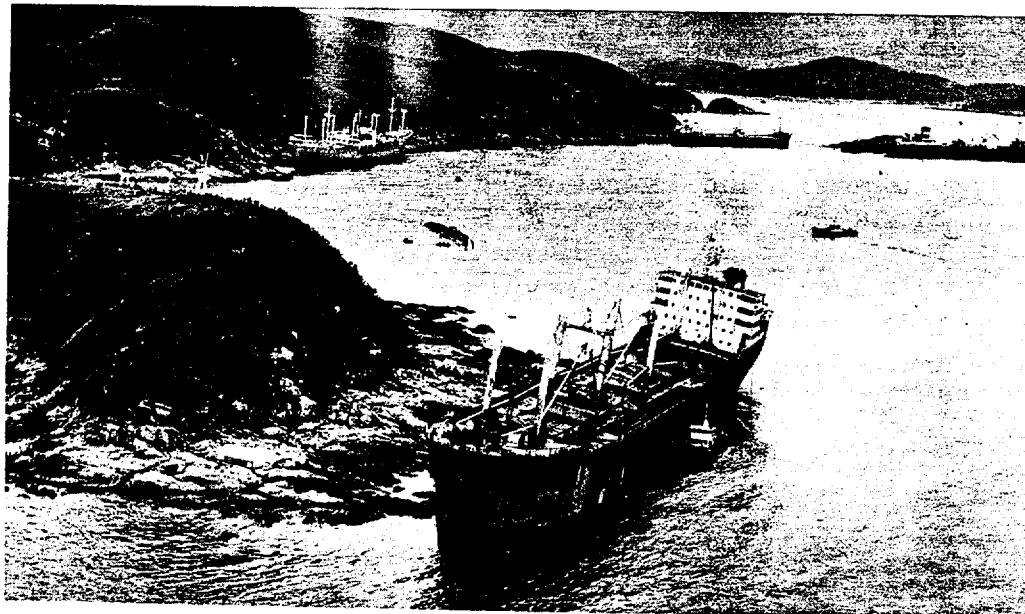
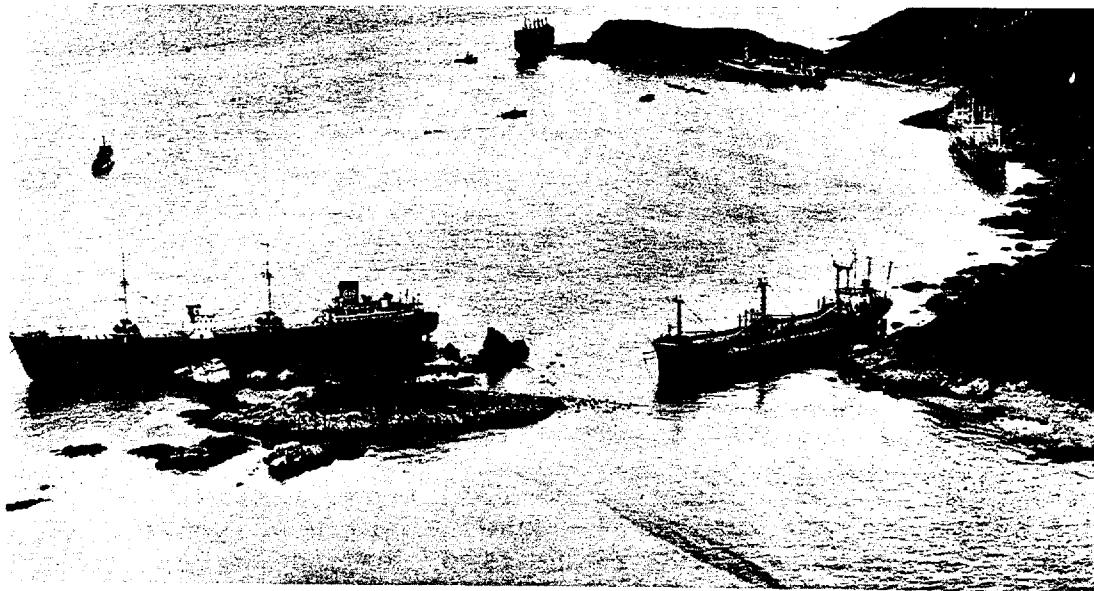


FIGURE 5-32. VICTIMS OF TYPHOON ROSE, FREIGHTERS RUN AGROUND ON LANTAO ISLAND, HONG KONG SURROUND THE CAPSIZED MACAO-HONG KONG FERRY, FATSHAN. (VESSELS AS SEEN IN THE TOP AND BOTTOM VIEWS INCLUDE THE FERNBANK, WINDFIELD TRADER, GALLANTRY, KOYOH MARU AND KAOSHSIUNG--COURTESY THE SOUTH CHINA MORNING POST.

TABLE 5-1. LISTING OF VESSEL CASUALTIES INCURRED AT HONG KONG DURING TYPHOON ROSE*

<u>VESSEL</u>	<u>FLAG</u>	<u>TONNAGE</u>
GREEN BAY	United States	11,021
FLYING DRAGON	United States	8,243
REGULUS	United States	---
AMERICAN HAWK	United States	7,909
FATSHAN (Ferry)	British Commonwealth	2,637
RED SEA	British Commonwealth	7,026
DWARKA	British Commonwealth	4,851
HUNTSLAND	British Commonwealth	9,353
EASTERN CAPE	British Commonwealth	6,205
JADE LILY	British Commonwealth	11,753
SEA CORAL	British Commonwealth	10,421
LEE HONG (Ferry)	British Commonwealth	1,127
MACAU (Ferry)	British Commonwealth	3,670
KIM SENG	British Commonwealth	---
GALLANTRY	Panama	7,582
MONRUBY	Panama	5,312
WINFIELD TRADER	Panama	11,038
KAOHSIUNG	Panama	1,289
TIEN HONG	Liberia	12,417
BILLY	Liberia	8,705
SHONAN MARU	Japanese	2,116
KYOHO MARU	Japanese	2,998
LAOSHAN	Somali	10,087
TAIPIENG	Somali	5,676
NURITH	Israel	6,982
COMANDANTE CAMILO CIENFUEGOS	Cuba	9,735
WORLD DALE	Greece	15,729
KOTA SENTOSA	Singapore	---
JILIN	China	6,804
FERNBANK	Norway	8,981
GUIMARAS	Philippines	3,555
WATUDAMBO	Indonesia	2,165
TUNG THAI	Taiwan	2,492
WAH FAT	Taiwan	---
ARISA	Taiwan	---

*SOURCE - 1. Casualty Returns, The Liverpool Underwriters' Association - Aug 1971.
 2. Mariner's Weather Log, NOAA - Vol 16, No 1

TYPHOON ROSE
EYE FIXES FOR CYCLONE NO. 21
10 AUG - 17 AUG 71

FIX NO.	TIME	POSIT	UNJT- METHOD	FLT	LVL	OBS	OBS	MVN	FLT	THKN	POSTT OF RADAR	
			-ACCY	FLT	LVL	SFC	MIN	700MB	LVL	WALL		
				700MB	WND	WND	SLP	HGT	TI/TD	CLD	REMARKS	
1	080000Z	11.3N 149.5E	54-P-----	700MB	---	---	---	---	---	--	INVESTIGATIVE FIX FIRST BLTN	
2	090537Z	12.5N 145.0E	SATELII-----	STG X H	---	---	---	---	---	--	FWC RDR GOOD FIX-91218	
3	091000Z	13.6N 145.1E	LND RDR----	---	---	---	---	---	---	--	13.5N 144.7E	
4	091100Z	13.8N 144.6E	LND RDR----	---	---	---	---	---	---	--	13.6N 144.9E	
5	091115Z	13.9N 144.6E	LND RDR----	---	---	---	---	---	---	--	GOOD FIX-91218	
6	091140Z	13.9N 144.5E	LND RDR----	---	---	---	---	---	---	--	13.6N 144.9E	
7	091200Z	13.9N 144.5E	LND RDR----	---	---	---	---	---	---	--	GOOD FIX-91218	
8	091210Z	13.8N 144.6E	LND RDR----	---	---	---	---	---	---	--	13.6N 144.9E	
9	091215Z	14.0N 144.5E	LND RDR----	---	---	---	---	---	---	--	GOOD FIX-91218	
10	091240Z	14.0N 144.6E	LND RDR----	---	---	---	---	---	---	--	13.6N 144.9E	
11	091315Z	13.8N 144.2E	LND RDR----	---	---	---	---	---	---	--	GOOD FIX-91218	
12	091340Z	13.9N 144.2E	LND RDR----	---	---	---	---	---	---	--	GOOD FIX-91218	
13	091415Z	13.9N 144.1E	LND RDR----	---	---	---	---	---	---	--	GOOD FIX-91218	
14	091420Z	13.8N 144.0E	LND RDR----	---	---	---	---	---	---	--	FWC RDR	
15	091440Z	13.9N 144.1E	LND RDR----	---	---	---	---	---	---	--	FAIR FIX-91218	
16	091515Z	14.2N 143.8E	LND RDR----	---	---	---	---	---	---	--	PSBL CNTR-91218	
17	091525Z	13.9N 143.7E	LND RDR----	---	---	---	---	---	---	--	FWC RDR	
18	091605Z	14.0N 143.1E	LND RDR----	---	---	---	---	---	---	--	FWC RDR	
19	092020Z	14.2N 142.1E	LND RDR----	---	---	---	---	---	---	--	FWC RDR	
20	092215Z	14.2N 142.4E	54-P- 1- 2	700MB	30	35	1000	3057	10/08	ELIP	N-S	WEAK EYE
21	100415Z	14.9N 141.5E	VQ-R-25----	---	---	75	---	---	---	10	4	RADIUS 30KT WINDS
												30 NM
22	100444Z	15.0N 141.5E	SATELII-----	STG C	---	---	---	---	---	10	7	STRONGER
23	101016Z	15.4N 140.8E	VQ-R- 8----	---	---	---	---	---	---	7	WC OPEN E SEMIC	
24	101115Z	15.7N 139.9E	54-P- 5- 5	700MB	60	---	990	3030	18/12	CIRC	15	WC OPEN E SEMIC
25	102010Z	16.0N 139.2E	54-P-----	700MB	60	---	---	3030	18/-	---	---	
26	102200Z	16.2N 138.8E	54-P- 2- 3	700MB	57	75	997	3048	18/11	CIRC	12	WC OPEN NE-SE SFC CNTR 3NM S
27	110352Z	17.0N 137.3E	VQ-P- 5----	---	50	45	999	---	28/23	---	---	NO WC-SML WND EYF
28	110543Z	17.0N 136.5E	SATELII-----	STG X DIA	3	CAT	2+0	---	---	---	---	STRONGER
29	110624Z	17.2N 136.0E	VQ-P- 5----	---	45	---	---	---	---	---	---	POORLY ORGANIZED
30	110939Z	16.9N 136.2E	VQ-P- 4- 2	---	45	40	997	---	32/25	---	---	NO WC-700MB FIX
31	111030Z	16.8N 134.0E	54-P-10-10	700MB	22	---	1001	3075	13/12	---	---	RDR PRES VRY POOR
32	112142Z	16.9N 132.8E	54-P-10-10	700MB	30	---	1000	3088	10/12	---	---	NO WC-WIND EYE
33	120558Z	17.5N 131.0E	VQ-P- 5----	---	80	980	---	27/25	CIRC	3	---	NO EYE VISIBLE
34	120642Z	17.5N 130.5E	SATELII-----	STG X DIA	3	CAT	2+0	---	---	20	5	WEAK BRKN WC
35	122335Z	17.8N 126.5E	54-P- 2- 3	700MB	90	100	980	2957	18/13	CIRC	20	WC OPEN N QUAD
36	130340Z	17.0N 125.0E	54-P- 2- 1	700MB	75	100	970	2920	18/11	CIRC	15	NO EYE VISIBLE
37	130545Z	18.0N 125.0E	SATELII-----	STG X DIA	3	CAT	3+0	---	---	20	5	NO EYE VISIBLE
38	131000Z	17.6N 127.9E	VQ-R- 2- 3	---	---	---	---	---	26/26	CIRC	20	NO WC
39	131315Z	17.6N 123.2E	VQ-R- 5----	---	120	---	---	---	26/23	CIRC	8	18.0N 124.6E
40	131526Z	17.6N 122.6E	VQ-R- 3----	---	---	---	---	---	---	---	18.3N 122.9E	
41	131925Z	17.4N 121.6E	54-P-14----	500MB	---	---	---	---	1/-4	---	18.0N 123.7E	
42	132102Z	17.3N 121.3E	54-P-10--	500MB	83	---	---	---	---	---	---	
43	140002Z	17.3N 120.0E	54-P-10--	500MB	---	---	---	---	---	---	---	
44	140425Z	17.5N 120.0E	54-P- 1- 5	700MB	60	65	987	2953	13/10	CIRC	8	RDR PRES POOR
45	140644Z	18.0N 119.5E	SATELII-----	STG X DIA	3	CAT	2+0	---	---	8	RAGGED EYE	
46	140945Z	17.5N 119.0E	54-P- 1- 4	700MB	80	70	987	2951	14/10	CIRC	30	WC CLSD W BRKS
47	142144Z	18.5N 116.4E	54-P- 2--	700MB	78	---	980	2917	16/13	CIRC	30	CLSD WC-CS OVC
48	150037Z	18.4N 116.3E	VQ-P- 5--	700MB	77	45	980	2911	14/09	CIRC	50	WC OPEN NE

TYPHOON ROSE
EYE FIXES FOR CYCLONE NO. 21
10 AUG - 17 AUG 71

NO.	TIME	POSIT	UNIT- METHOD -ACCY	FLT LVL	OBS WND	OBS WND	MTN SLP	FLT LVL	EYE	ORLEN- FORM	EYE TAITON DIA	THKN 45	WALL CLD	REMARKS	POSIT OF RADAR	
49	150303Z	18.3N 114.5E	VU-P- 1---	700MB	72	60	080	2917	15/11	CIRC	45	--	--	CLSD WC-CS OVC		
50	150347Z	18.5N 114.5E	SATELLI---	STA X DIA 2 CAT 3.5											FYE HRLY VISIBLE	
51	150700Z	18.8N 114.5E	54-P- 3- 3	700MB	100	115	060	2798	19/12	CIRC	25	4	--	CLSD WC		
52	151000Z	19.0N 114.0E	54-P- 3- 3	700MB	100	130	062	2780	19/11	CIRC	20	5	--	CLASSIC RDR PRES		
53	151300Z	19.3N 114.6E	54-P- 5- 5	700MB	90	---	061	2768	19/11	CIRC	25	5	--	CLSD WC		
54	151400Z	19.2N 114.5E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
55	151500Z	19.3N 114.8E	54-P- 3- 3	700MB	100	---	059	2746	19/14	CIRC	25	5	--	CLSD WC		
56	151912Z	19.6N 114.5E	VU-R- 3- 5	----	----	----	----	----	----	CIRC	13	--	--	WC OPEN W	18.9N 114.8E	
57	152100Z	19.9N 114.3E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
58	152220Z	19.9N 114.3E	VU-R- 3- 5	----	----	----	----	----	----	CIRC	15	--	--	WC OPEN S	18.7N 114.6E	
59	160000Z	20.2N 114.2E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
60	160015Z	20.1N 114.1E	VU-R- 7- 3	----	----	----	----	----	----	CIRC	15	--	--	WC OPEN W	19.3N 114.2E	
61	160100Z	20.5N 114.1E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
62	160200Z	20.5N 114.1E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
63	160300Z	20.6N 114.0E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
64	160400Z	20.8N 114.0E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
65	160500Z	20.8N 114.0E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
66	160600Z	20.9N 114.0E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
67	160646Z	21.0N 114.0E	SATELLI---	STA X DIA 3 CAT 3.5											RAGGED EYE	
68	160700Z	21.0N 114.0E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
69	160900Z	21.2N 114.0E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E
70	161100Z	21.4N 114.0E	LND RDR---							----	----	--	--	--	GOOD FIX-VHHH	22.3N 114.2E

TYPHOON ROSE

0000Z 10 AUG TO 0000Z 17 AUG

BEST TRACK				WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
POSIT	WIND	POSIT	WIND	ERRORS	DST WIND	POSIT	WIND	ERRORS	DST WIND	POSIT	WIND	ERRORS	DST WIND	POSIT	WIND	ERRORS	DST WIND		
100000Z	14.4N 142.2E	45	14.3N 142.2E	30	18 -15	15.3N 138.2E	45	72 -20	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
100600Z	15.1N 141.3E	60	14.8N 141.1E	65	21 5	16.5N 137.4E	90	50 35	17.8N 136.3E	110	194 30	-- --	-- --	-- --	-- --	-- --			
101200Z	15.4N 140.5E	65	15.5N 140.5E	70	0 5	16.8N 136.8E	95	86 35	18.1N 133.7E	115	246 25	19.8N 130.7E	130	433 24	-- --	-- --			
101800Z	15.9N 139.7E	70	15.0N 139.8E	70	8 0	17.0N 130.4E	95	149 30	18.3N 133.2E	115	303 20	-- --	-- --	-- --	-- --	-- --			
110000Z	16.4N 138.3E	65	16.3N 138.4E	75	13 10	17.7N 134.5E	100	130 30	19.3N 131.1E	110	288 10	21.1N 128.3E	120	482 98	-- --	-- --			
110600Z	17.1N 136.8E	55	17.1N 136.8E	60	8 5	19.0N 131.8E	60	103 -20	21.2N 128.3E	60	283 -45	-- --	-- --	-- --	-- --	-- --			
111200Z	16.4N 135.3E	60	17.4N 135.0E	45	46 -15	19.4N 131.0E	30	141 -60	21.3N 126.0E	45	292 -65	23.1N 123.0E	60	413 -18	-- --	-- --			
111800Z	16.4N 133.8E	65	17.8N 134.6E	40	75 -25	19.9N 129.9E	40	173 -55	21.8N 125.7E	50	335 -45	-- --	-- --	-- --	-- --	-- --			
120000Z	17.1N 132.3E	70	16.9N 132.2E	25	13 -45	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
120600Z	17.5N 130.9E	80	17.5N 131.0E	65	6 -15	19.7N 126.3E	80	143 -25	22.0N 122.4E	80	314 10	-- --	-- --	-- --	-- --	-- --			
121200Z	17.6N 129.4E	90	17.9N 129.4E	70	18 -20	20.1N 124.4E	80	160 -30	22.3N 120.3E	80	295 5	24.8N 117.0E	10	758 -74	-- --	-- --			
121800Z	17.7N 127.9E	95	18.5N 128.1E	70	49 -25	20.6N 123.3E	80	205 -15	23.8N 119.4E	75	326 -5	-- --	-- --	-- --	-- --	-- --			
130000Z	17.7N 126.3E	100	17.8N 126.4E	95	8 -5	19.2N 120.8E	95	108 15	21.5N 115.7E	90	193 5	-- --	-- --	-- --	-- --	-- --			
130600Z	17.7N 124.9E	105	17.7N 125.0E	100	6 -5	18.0N 119.1E	85	87 15	21.0N 114.0E	90	169 -10	-- --	-- --	-- --	-- --	-- --			
131200Z	17.6N 123.4E	110	17.7N 123.4E	95	6 -15	19.4N 117.6E	85	111 10	21.8N 112.7E	80	286 -25	-- --	-- --	-- --	-- --	-- --			
131800Z	17.6N 122.0E	95	17.7N 122.0E	85	18 -10	19.3N 116.7E	85	90 5	21.0N 112.4E	80	185 -35	-- --	-- --	-- --	-- --	-- --			
140000Z	17.6N 120.7E	80	17.3N 120.8E	60	8 -20	19.3N 115.6E	75	69 -10	22.1N 111.6E	40	196 -80	-- --	-- --	-- --	-- --	-- --			
140600Z	17.5N 119.5E	70	17.6N 119.7E	65	13 -5	19.6N 115.0E	80	69 -20	22.3N 111.3E	40	181 -75	-- --	-- --	-- --	-- --	-- --			
141200Z	17.7N 118.4E	75	17.6N 118.7E	70	18 -5	18.6N 114.4E	85	45 -20	20.4N 111.0E	85	178 -25	-- --	-- --	-- --	-- --	-- --			
141800Z	17.9N 117.3E	80	17.7N 117.5E	75	16 -5	19.1N 113.4E	85	66 -30	20.9N 110.3E	70	217 -20	-- --	-- --	-- --	-- --	-- --			
150000Z	18.3N 116.2E	95	18.7N 116.0E	80	26 -5	21.0N 112.1E	80	137 -40	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
150600Z	18.6N 115.6E	100	18.9N 115.7E	75	6 -25	20.4N 112.3E	75	96 -40	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
151200Z	19.1N 115.0E	105	19.1N 114.7E	100	17 -5	21.1N 111.5E	90	140 -20	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
151800Z	19.5N 114.5E	115	19.4N 114.5E	105	6 -10	21.4N 112.0E	90	118 0	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
160000Z	20.0N 114.3E	120	20.0N 114.1E	100	11 -20	22.3N 112.5E	70	69 35	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
160600Z	20.6N 114.0E	115	21.0N 113.9E	95	25 -20	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
161200Z	21.4N 114.0E	110	21.5N 113.9E	90	8 -20	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
161800Z	22.3N 113.9E	90	22.0N 113.9E	85	18 -5	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			
170000Z	23.1N 113.4E	35	23.1N 113.1E	50	16 15	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --			

TYPHOONS WHILE WIND OVER 35KTS
 WARNING 24-HR 48-HR 72-HR
 AVERAGE FORCAST ERROR 17NM 109NM 245NM 422NM
 AVERAGE WIND ANGLE ERROR 13NM 83NM 152NM 222NM
 AVERAGE MAGNITUDE OF WIND ERROR 13KTS 26KTS 30KTS 38KTS
 AVERAGE BIAS OF WIND ERROR -10KTS -8KTS -18KTS -8KTS
 NUMBER OF FORECASTS 29 24 18 4

ALL FORECASTS
 WARNING 24-HR 48-HR 72-HR
 17NM 109NM 245NM 422NM
 13NM 83NM 152NM 222NM
 13KTS 26KTS 30KTS 38KTS
 -10KTS -8KTS -18KTS -8KTS
 29 24 18 4